

REMARKS

The Examiner is thanked for the thorough examination of the present application. The Office Action, however, has continued to reject all pending claims 15-32. This is a full and timely response to outstanding Action mailed Nov. 28, 2006. Upon entry of the amendments in this response, claims 15-32 remain pending. In particular, Applicant has amended claim 15, without prejudice, waiver, or disclaimer of the subject matter originally embodied therein. In this submission, claim 15 is amended to recite the features of “a carbon-containing third noble metal layer directly on the second noble metal layer, and a diamond-like carbon (DLC) passivation film directly on the third noble metal layer”. Support for this amendment can be found in the original application at least in FIG.1 showing the third noble metal layer 103 directly on the second noble metal layer 102, and a diamond-like carbon (DLC) passivation film 104 directly on the third noble metal layer 103. Accordingly, no new matter has been added has been added to this application by this amendment. Reconsideration and allowance of the application and presently pending claims are respectfully requested.

Rejections under 35 U.S.C 103(a)

Claims 15, 16, 18-25, 27, 28 and 30-32 are rejected under 35 U.S.C 103(a) as allegedly unpatentable over applicant's admitted state of the prior art (AASPA) in view of Aoki (cite by Applicant). Claims 26 and 29 stand rejected under 35 U.S.C 103(a) as allegedly unpatentable over AASPA in view of Aoki, as applied to claims 15, 16, 18-25, 27, 28 and 30-32, above, and further in view of Hirota (supplied by Applicant).

With regard to the 35 USC §103 rejections, it is noted that AASPA discloses a method to renew a molding die comprised of a diamond-like carbon (DLC) passivation film overlying an intermediate layer by removing the DLC layer using oxygen plasma and grinding the intermediate layer; the intermediate layer is very thick, such that renewing that layer is time-intensive. Noble metal layers such as Ir-Re based alloys are known for use on molding dies, but that such layers are only able to be removed by grinding.

However, AASPA discloses a molding die having a DLC layer acting as a passivation film of a substrate and an intermediate layer of silicon carbide or silicon nitride therebetween in JP1320233. AASPA also discloses a molding die having a DLC layer, formed by sputtering, acting as a passivation film of a substrate, and two intermediate layers, silicon carbide and ion-implanted DLC, therebetween in JP6191864. Hirota (JP11079760) discloses a molding die having a DLC layer acting as a passivation film of a substrate and a consumable β -silicon carbide acting as an intermediate layer, which can be remove the DLC layer using oxygen plasma and griding the β -silicon carbide layer to grain a predetermined shape. Aoki (JP63103826) discloses an Ir-Re-C alloy as a passivation film directly on a tungsten carbide substrate with no intermediate layer therebetween. As will be further described below, even in combination, the AASPA and cited art do not teach, disclose, or suggest all of the features of the presently claimed embodiments.

Turning now to the claims, independent claim 15 recites:

15. A renewing method for a glass molding die, comprising:
providing a used glass molding die comprising a substrate, a first noble metal layer overlying the substrate, a second noble metal layer overlying the first noble metal layer, **a carbon-containing third**

noble metal layer directly on the second noble metal layer, and a diamond-like carbon (DLC) passivation film directly on the third noble metal layer;

removing the passivation film and partially removing the third noble metal layer using oxygen plasma;
grinding and polishing the molding die to completely remove the third noble metal layer;
cleaning the polished molding die;
forming a fourth noble metal layer directly on the second noble metal layer; and
forming a second passivation film directly on the fourth noble metal layer, wherein the second passivation film comprises the same material as the passivation film directly on the third noble metal layer.

(*Emphasis added.*) Claim 15 presently defines over the cited art for at least the reason that the cited art fails to disclose those features emphasized above.

Accordingly, the express claim language of independent claim 15 requires a carbon-containing third noble metal layer directly on the second noble metal layer (rather than just merely “overlying”), and a diamond-like carbon (DLC) passivation film directly on the third noble metal layer. In this regard, FIG. 1 of the presently application provides that the **third noble metal layer 103 is directly on the second noble metal layer 102, and a diamond-like carbon (DLC) passivation film 104 is directly on the third noble metal layer 103.**

AAPSA and the cited references, either individually or in combination, are legally deficient for the purpose of rendering obvious the **a carbon-containing third noble metal layer being directly on the second noble metal layer, and a diamond-like carbon (DLC) passivation film being directly on the third noble metal layer,** as expressly recited in independent claim 15 (as amended herein). Additionally, the claimed embodiments define **a carbon-containing third noble metal layer acting as an intermediate layer between the substrate and the DLC passivation film of a molding**

die to improve adhesion therebetween. Further, carbon atoms in the carbon-containing third noble metal layer prevent grain growth, resulting in improved heat resistance. The third noble metal layer's denser structure prevents elements in the substrate from diffusing into the passivation film when the third noble metal layer is acting as the intermediate layer, preventing deterioration of the passivation film and increasing lifetime of the molding die.

The claimed embodiments further define a DLC layer acting as a passivation film for the molding die and a carbon-containing third noble metal layer acting as an intermediate layer between the substrate and the DLC passivation film of the molding die, which is easily removed by oxygen plasma when renewing, to improve renewability and simplify renewing.

For at least these reasons, the rejection of claim 15 should be reconsidered and withdrawn. Insofar as claims 16-32 depend from claim 15, the rejections of these claims should also be withdrawn.

CONCLUSION

In view of the foregoing, it is believed that all pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

A credit card authorization has been provided to cover the fee of the accompanying RCE. No additional fee is believed to be due in connection with this submission. If, however, any fee is deemed to be payable, you are hereby authorized to charge any such fee to Deposit Account No. 20-0778.

Respectfully submitted,

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